# Lima Bean (Phaseolus lunatus) Development at Beltsville

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Lima bean development through breeding has been conducted at Beltsville for over 50 years. With the retirement of Charles A. Thomas, Research Plant Pathologist, in December 1989, I was given responsibility for completing this research. Dr. Thomas recommended that several additional lines from his program should be advanced for selection and possible release. Several such releases are now in preparation. In preparing these releases, it was considered useful to prepare a list of all previous releases. As a result, Table 1 has been prepared and is published here for the benefit of others interested in lima bean improvement. Dr. Thomas and Vansie L. Blount, Research Technician on this project for the past 27 years, have assisted in its preparation.

This lima bean research and these cultivar and germplasm releases have been the responsibility of Dr. Thomas from mid-1972 through 1989, of Robert E. Wester from 1936 to 1972, and of Roy Magruder from about 1931 to the mid 1940's. A major priority has been combination of green seed coats and cotyledons with high yield (4). Resistance to downy mildew, root knot nematodes, and anthracnose have also been major objectives. Upon release of the first mildew resistant cultivar, Thaxter, in 1958, resistance breaking race B was discovered (5). This was followed by discovery of races C and D (2). However, no additional races have been found since discovery of race D in 1975. The recent releases are resistant to all four races.

The recently most popular cultivars and lines of those released have been Fordhook 242, B2C from which the baby green cultivar Eastland was selected, and Fordhook 1072 (1,3). Recently released mildew resistant baby green (MRBG) 84-3, anthracnose resistant Jackson Wonder (ARJW) 85-1, and the soon to be released mildew resistant Fordhooks (MRF) appear likely to become popular for these kinds of bush limas. The three pole limas listed in Table 1 should be good sources for improvement of this type. Seeds are still available at Beltsville for only the most recent releases. Seeds of all releases were distributed at the time released. The only known omission from Table 1 is the cultivar Triumph that was released about 1948. Included in Table 1 are the plant introductions (PIs) that have been sources of disease resistances. Several of the lines listed in Table 1 have been joint releases with neighboring state experiment stations.

References

1. Thomas C. A. 1985. Registration of F-1072 lima bean germplasm. Crop Sci. 25:369.
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3. Thomas, C. A. and Fisher, V.J. 1980. Registration of B2C lima bean. Crop Sci. 20:553.
4. Wester, R. E. 1965. Green cotyledon in lima beans, its origin and development. Seed World 96 (11):30.
5. Wester, R. E. and Jorgenson, H. 1959. A new race of Phytophthora phaseoli from lima beans. Plant Disease Reptr. 43:184-186.

Table 1. Beltsville lima bean releases and plant introductions used as sources of resistance[a/]

| Name | Date | Type | Pedigree | Characteristics |
|---|---|---|---|---|
| Dr.M-F | 1991 | Pole Grn. | F169 x Dr. Martin | Pole Fordhook (Dr. Martin - Fdhk.) |
| Belgrn | 1991 | Pole Grn. | F169 x Dr. Martin | Exc. flavor |
| MRF90-1 | 1991 | Grn. Fdhk. | F242 x F222 (fr. MRF79) | R-A,B,C,D P.p., high yield |
| MRF84-1 | 1991 | Grn. Fdhk. | [$F242_4$x(C171xF242]xMRF79 | R-A,B,C,D P.p, high yield |
| MRF84-2 | 1991 | Grn. Fdhk. | F1072x(F1072xMRF79) | R-A,B,C,D P.p., high yield |
| PSBG-1 | 3/9/90 | Baby Grn. | (Kingston x Bridgeton)x B2C | Plump seeds, high pods |
| PSBG-2 | 3/9/90 | Baby Grn. | (Dixie Butterpea X Kngstn.)x Dixie B. | Plump seeds, high pods |
| LGSP87-1 | 2/22/90 | Pole Grn. | (F169 x Dr. Martin) x Dr. Martin | Lg. Seeds; tol. drought, AP; |
| MRBG84-3 | 1/24/90 | Baby Grn. | [(1068 x PI195342)x1068]xBrgtnxBrgtn. | R-A,B,D and tol.to C P.p. |
| ARJW85-1 | 3/28/89 | Jack.Wond. | $JW_5$x(JWxPI199791) | Anthracnose tolerant |
| BG-84-2 | 12/28/87 | Baby Grn. | [(1068xPI195342)x1068]xBrgtn.xBrgtn. | Hyp.R-A,B,D and tol. to C P.p. |
| MRF79 | 3/12/81 | Grn. Fdhk. | (PI195342xF242)xF169 | R-A,B,C,D, P.p. sm. pods |
| F372 | 1978 | Grn. Fdhk. | F369xPI195342 | R-A,B,C P.p., sm. Plant, weak yield |
| F1072 | 1978 | Grn. Fdhk. | F369xPI195342 | R-A,B,C P.p., tol. drought |
| B2C | 1/5/76 | Baby Grn. | [(1068xPI195342)x1068]xBrgtn. | R-A,B,C,D P.p.; Eastland sel. from |
| F169 | 1/9/75 | Grn. Fdhk. | $F242_3$x[(PI189403xF242)xS400] | R-A,B,D P.p.; tight pods; exc. flavor |
| F369 | Not Rel. | Grn. Fdhk. | Sib of F169 | R-A,B,D P.p. |
| C171 | 4/12/73 | Baby Grn. | 1068xPI195342 | R-A,B,C P.p. |
| Brgtn | 1/12/72 | Baby Grn. | Dover x S33-2a(=Mendoza Bush) | R-A,B,D P.p.; early; pods below lvs. |
| 1068 | Not Rel. | Baby Grn. | Sib of Bridgeton | R-A,B,D P.p. |
| PI199791 | Not Rel. | --- | From British Guiana, 1952 | R Anthracnose |
| PI195342 | Not Rel. | | From Guatemala, 1951 | R-A,B,C, P.p. |
| PI189403 | Not Rel. | --- | cv.Piloy,fr. Antigua, 1950 | R-A,B,D P.p. |
| PI164155 | Not Rel. | --- | From Nagpur, India, 1948 | R-A P.p. |
| Dover | 2/70 | Baby Grn. | PI189403 x Thaxter | R-A,B,D P.p.;later than Thaxter |
| US861 | 4/4/66 | Grn. Fdhk. | $F242_5$[F242x$F_3$(Early Thorogreenx PI164155)] | R-A P.p. |
| Thaxter | 1958 | Baby Grn. | PI164155 x Early Thorogreen | R-A P.p., Heavy Yield |
| Nemagreen | 1956 | Baby Grn. | (Oklahoma 27x Ea. Thgrn) x Ea. Thgrn. | R root knot nematode |
| Peerless | 1946 | Grn. | Fordhook Bush x Sieva Pole | R lima bean mosaic virus (=US243) |
| Fdhk 242 | 1944 | Fdhk. | Selection from Fordhook | High Yield, Medal Winner |
| EarlyMar. | 1944 | Grn. | | Early Maturity, south adapted |
| BabyFdhk. | 1939 | | Fordhook x Henderson Bush | Early Maturity |

a/ Abbreviations: Brgtn. = Bridgeton; Dixie B.= Dixie Butterpea; Exc. = Excellent; F, Fdhk. = Fordhook; Grn. = Green; JW = Jackson Wonder; Kngstn. = Kingston; Lg. = Large; lvs. = leaves; mod. = moderate; Not Rel. = Not released; PI =plant introduction; P.p. = Phytophthora phaseoli; R = Resistant; sel.= selected; sm.= small; tol. = Tolerant.